DOCUMENT RESUME

ED 429 333 EA 029 709

AUTHOR Stanley, Anthony; Gifford, Lorna J.
TITLE The Feasibility of 4X4 Block Scheduling in Secondary Schools: A Review of the Literature.
PUB DATE 1998-11-00
NOTE 17p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (27th, New Orleans, LA, November 4-6, 1998).
PUB TYPE Information Analyses (070) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Block Scheduling; Educational Change; Educational Innovation; Elementary Secondary Education; Flexible Scheduling; Instructional Innovation; *Literature Reviews; *School Schedules; Time Factors (Learning)
IDENTIFIERS 4 X 4 Schedule

ABSTRACT

This paper reviews the literature on 4x4 block scheduling. Studies reveal that the advantages of such scheduling are simplicity, potential for greater student achievement, and reduced disciplinary referrals. Discipline is enhanced through this type of schedule because it decreases the number of times that students are moving in the halls between disciplined environments. The schedule promotes student achievement by allowing students to attend additional classes during their 4-year high school tenure, by encouraging more engaging learning activities, and by allowing students to concentrate narrowly on the four subjects taken each semester. This concentration may allow for better mastery of material, but it does not allow for the breadth of coverage found in traditional schedules. Consequently, the 4x4 block schedule should not be implemented in districts where test scores and strict adherence to state curriculum guides are considered sacred. Furthermore, student motivation plays a large part in the success or failure of the 4x4 block schedule; motivated students excel in such an environment, whereas poorly motivated students sometimes fall further behind than in traditional schedule environments. It is emphasized that careful planning in implementing 4x4 scheduling is essential to its success. Contains 21 references. (RJM)

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The Feasibility of 4x4 Block Scheduling in Secondary Schools: A Review of the Literature

Anthony Stanley and Lorna J. Gifford

Northwestern State University

ED 429 333

Paper presented at the Mid-South Educational Research Association, annual meeting, November 4-6, 1998, New Orleans, LA.

EA 029 709

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Abstract

The call for improved education in modern America, coupled with the scarcity of resources with which to accomplish such a task, requires a thoughtful reallocation of the currently available resources in order to make improvements in instruction. Rearranging time is one of the most accessible methods available to stretch current resources to greater use. Among the many alternative schedules available, the 4x4 block is one of the most widely implemented. Its attractive characteristics are drawing more adherents daily, begging the question of how applicable the model truly is to improved instruction. The feasibility of implementing the 4x4 schedule is determined from consideration of the available literature and logical thought.

The Feasibility of 4x4 Block Scheduling in Secondary Schools: A Review of the Literature

Introduction and Review of Literature

In an era of budgetary concerns and economy-wide downsizing, educators are beset by a populace demanding improved test scores and graduates who are competitive in a global marketplace. Educators are asked to find solutions from a withering pool of resources. Facing limited resources, the only means by which today's educator and administrator can improve instruction is the reallocation of the resources at hand (fiscal, spatial, and temporal) in more efficient structures.

Fiscal resources are both fixed and limited. They are set by the government and often require a tax referendum to be increased. Spatial resources, or physical plant space and grounds are also fixed and limited. This elimination of fiscal and spatial resources as variables leaves temporal resources as the one area open to restructuring in the name of efficiency.

Reallocation of time must be accomplished within the bounds of the current school day and school year, else it would require an adjustment of fiscal policy (Hackmann, 1995). Thus, the manipulation of time requires restructuring the time presently available into more effective segments (Canady & Rettig, 1995).

This reform has been attempted in a myriad of ways within the last decade, and under a myriad of names: the Copernican plan; the trimester plan; the double-mod hybrid schedule; the A/B rotating week model; and the 4x4 schedule (Traverso, 1996; Shortt & Thayer, 1995). While several plans are barely distinguishable variants of a common base, there are a few basic models.

The trimester plan divides the school year into three sessions of 60 days each (Brown, 1996; O'Neil, 1995). Students attend either two or three classes per session for a total of between six and nine Carnegie units per year (Traverso, 1996). The strength of the plan is a smaller number of subjects at any given time, with each class in an extended block. It does have the weakness of splitting one session around the traditional Christmas break.

The A/B day, rotating week schedule involves students attending eight classes per semester, four 90 minute periods on "A" days and four different 90 minute periods on "B" days. The weeks alternate between even and odd numbers of respective lettered days (Shortt & Thayer, 1995). While classes are typical yearlong courses with eight classes at the same time, the plan does gain the benefits of extended block scheduling in regards to discipline and allowance of a greater variety of teaching techniques.

The double-mod hybrid simply includes "double-mod," or extended 90-minute classes, as an option among regular 50-55 minute classes. Extended block classes are offered only for classes, which appear to require them. Students mix and match a schedule of traditional and double-mod classes to fill their school day (Boarman & Kirkpatrick, 1995).

Of all of the plans mentioned, the 4x4 is the least complicated, and apparently the most popular. The basic idea of the 4x4 plan is that the number of periods per day is reduced from six or seven to four, each being approximately 90 minutes in duration. These periods meet every day and allow students the instructional equivalent of four year long classes within a single semester.

Teachers under the 4x4 plan are responsible for fewer classes. Instead of five or six classes of 25-30 students per semester, teachers teach three classes of 25-30 students per semester, with 90 minutes reserved for planning. The number of students that teachers are responsible for knowing personally is reduced from 125-180 to 75-90 per semester (Queen, Algozzine, & Eaddy, 1997). This may or may not require an staff increases, depending upon current certifications.

The 4x4 plan has been the basis for many different variations in instructional focus. The extra time might be used to toughen the requirements for graduation in order to keep up with the world; to allow for more Advanced Placement courses; to allow students to enroll concurrently in a post secondary institution; or to make work study, apprenticeships, or cooperative work options more available. Each idea has its logic and its proponents.

These radical changes in the temporal structure have drawn many criticisms. Among the most frequent concerns are such questions as whether or not the same amount of material can be covered in a semester that has previously been covered within a year. Also voiced is how to handle sequential courses, such as foreign languages, or non-academic offerings, such as band, that would suffer from gaps between course offerings (Rettig & Canady, 1996). Concerns have been raised about the deficiencies which can result from merely restructuring time blocks alone without adjusting policy, standards, and loci of control (Cawelti, 1995), or about student scores when Advanced Placement courses finish the fall before the spring examination (Edwards, 1995b). Questions have likewise been raised concerning boredom in a 90-minute class. And finally, concerns about discipline

problems with children effectively restrained in class for longer periods of time have been voiced (Schoenstein, 1994).

Each of these concerns is valid, and most of them have a theoretical answer. The position of the 4x4 advocates is that the extended time blocks allow new and more varied instructional methods to be employed, alleviating most criticisms.

Advocates admit that teachers will not be able to cover the same content in a semester as in a year. They argue, however, that the lengthened block allows them to engage the students as more active learners, and that the activities available increase retention of the material, thus, reducing the amount of review time necessary in subsequent classes and negating the effect of covering less content within each class (Schoenstein, 1994).

It has been noted that changing over to a block schedule in the absence of a complementary restructuring of school policy and standards may be counterproductive. Cawelti (1995) suggests that schools considering a move to block scheduling take the extra time to restructure assessment, performance standards, and community involvement.

Regarding Advanced Placement tests, the theoretical answer is that the intensified blocks of instructional time will, once again, increase comprehension and retention. This will hopefully negate the lag between completion of a fall course and commencement of spring testing.

The theoretician's answer to the question of student boredom in a 90-minute period is found in the potential of the extended block to allow varied types of instruction within the period. Maintaining variety and shifting between different

activities allows students to shift tempo with each new activity, thereby fighting monotonous instruction (Fitzgerald, 1996; Rettig & Canady, 1996).

The answer to discipline problems in the extended block is also related to shifting instructional methods to maintain student attention. An attentive student rarely causes problems. Also, the 4x4 model decreases discipline problems by reducing the number and lengths of hall time between classes. This decreased hall time is a major tenet of the plans proponents (Festavan, 1996).

The one criticism that has no satisfactory reply is that courses which require retention of previous material into the next semester are hurt by lag time due to scheduling vagaries which would place "dead" semesters in the course sequence. Also courses such as music performance, which require enrollment all year, may be sacrificed to meet the block schedule.

The ramifications of the 4x4 schedule upon the teacher's instructional capacity are broad, but bound to the methods that the teacher employs. Since the teacher deals with fewer students per semester, the instructor can become more familiar with each individual student's needs. The teacher also gains more planning time, since the one daily planning period is extended to 90 minutes, and he or she only has to plan for three separate classes (Queen et al., 1997). Extra time would also allow for instruction to include more stimuli for non-auditory or non-visual learners (Fitzgerald, 1996).

In regard to quantitative evidence to support or disprove these claims for increased efficiency, it becomes evident that the evaluation of the 4x4 block schedule is still in its infancy. The majority of research has been case studies with

more subjective evaluation than empirical support. Those studies which do draw from a wider base of data or which do employ a statistical approach have been too brief in duration to provide adequate numbers for trustworthy comparisons and conclusions.

Among the case studies completed, several found that the intensive block schedule did result in initial improvements in student achievement (Buckman, King & Ryan, 1995; Cunningham & Nogle, 1996; Edwards, 1995a; Edwards, 1995b; Fitzpatrick & Mowers, 1997; Reid, 1996; Robbins & Geiger, 1996; Shoenstein, 1994). These initial improvements sometimes leveled out over time (Reid, 1996; Schoenstein, 1994), but tended to remain significantly higher than previous achievements (Fitzpatrick & Mowers, 1997).

These student achievements have not been uniform, however, as some researchers have pointed out that students who are high achievers at the outset improve, whereas students at risk may slip through the cracks and get even further behind than in a typical school structure (Edwards, 1995b; Shoenstein, 1994).

From a teacher's standpoint, only subjective data is currently available. The general consensus is that they feel more effective in instruction and classroom management (Edwards, 1995a; Queen et al., 1997; Schoenstein, 1994; Shortt & Thayer, 1995; Wilson, 1995). Their morale tends to be higher, and the reduction of stress related to planning is significant (Festavan, 1996; Schoenstein, 1994).

From the above literature, we see that the 4x4 intensive block schedule can potentially increase the efficiency of learning in high school settings. The current study proposes to determine from the literature and personnel resources available

whether or not the 4x4 intensive block schedule is a viable tool to attain greater efficiency in classroom instruction and student achievement

Discussion

It appears that the 4x4 block schedule has much to recommend it. Most of its liabilities can be argued away by its proponents, and its advantages appear substantial. While straightforward on paper, the schedule's application should require in-depth consideration with respect to the particular situation at hand.

The greatest advantages of which the 4x4 block schedule can boast are simplicity, potential for greater student achievement, and reduced disciplinary referrals. The schedule can be called simple because students are responsible for four classes at a time, classes which meet everyday, and because teachers must prepare for only three classes for one semester, with a sizable planning period each day.

The schedule tends to reduce disciplinary referrals by decreasing the number of times that students are moving in the halls between disciplined environments. The logic holds that the less time students are between classrooms, the less chance they have to encounter trouble.

The schedule promotes student achievement by allowing the attendance of additional classes during the four-year high school tenure, by allowing more engaging learning activities, and by allowing students to concentrate narrowly on the four subjects taken each semester.

Regarding the student to teacher ratio, changing schedules will, in and of itself, affect neither the overall number of students nor the overall number of

teachers. There will still be the same number of teachers and students as there were before, but the allocation of these people in classes may alter classroom ratios substantially. In a typical 4x4 block, one out of four teachers (75%) will be planning at a time, whereas, in a traditional six or seven period day, only one out of six or seven teachers (83-86%) is on planning period at any given time. This situation will either necessitate larger class sizes or the addition of extra faculty (Hackmann, 1995).

These matters aside, it is true that, class size remaining constant, teachers would be responsible for fewer students at any one time. While they would still become familiar with the same number of students over a school year, the emotional wear of dealing with individual students would be lessened for any given time. Thus, it is apparent that implementation of the 4x4 block schedule is a complex issue with respect to the topic of student to teacher ratios.

Regarding content covered, the 4x4-block schedule decreases the class time available per course by 10-18%. The popular wisdom holds that the longer blocks of time will encourage more in-depth examination of specific topics, thus aiding retention (Schoenstein, 1994). This better retention will provide a better basis for future learning, thus building a better gatherer and interpreter of knowledge.

While the logic appears sound, and while the long-term benefits appear self-evident, logic and long-term benefits have little place in current educational assessment. State curriculum guidelines are not long-term documents, but are grade specific, requiring mastery within a specified time frame. Similarly, national standardized achievement tests are administered yearly, with specific

expectations for each grade level. Administrators and supervisors who use such measures may not be interested in a potential increase in such scores over a multi-year period, but will demand reasons for the present year's slumped scores.

Once again, the complexities of a 4x4-block schedule require careful judgement in each specific situation to determine the feasibility of the model. The philosophy of the local district and state are tantamount here. An organizational hierarchy, which stresses ever-increasing test scores, will not be amenable to a schedule change that would threaten test scores. An organizational structure, which can see beyond the current year's test scores, may feel that a temporary drop in achievement test scores is a reasonable growing pain opt for the 4x4 model. Evidence provided by case studies (Edwards, 1995a; Edwards, 1995b; Fitzpatrick & Mowers, 1997; Reid, 1996; Shoenstein, 1994) does indicate that slumping test scores are not a necessary result of restructuring.

Other test scores may be adversely affected by a 4x4 schedule. Advanced Placement (AP) tests are given in the spring of each year. If a student is forced to schedule an AP preparatory class in the fall of the year and then take the AP exam in the following spring, the student may forget the content during the lapse and score poorly on the exam. At the same time, if AP preparatory classes are scheduled for the spring semester, the condensed format of 4x4 block classes will prevent the student from having covered as much of the material by exam time as students on traditional schedules, (O'Neil, 1995). Some schools have adopted a 3/4 year plan for AP preparatory classes, ending the classes at the time AP exams are scheduled (Schoenstein, 1994). The sketchy data available to educators at

present does not support an argument for decreased AP examination scores (Edwards, 1995a; Edwards, 1995b; Schoenstein, 1994). In fact, in some cases, AP scores have improved within a 4x4 block format (Edwards, 1995b).

Concerning other courses, which would be harmed by a 4x4 format, sequential courses such as foreign language suffer potential detriment, as do such programs as music performance and band. Foreign language students may have to schedule gaps between successive courses, forgetting too much of the first course to easily master the second. This would require excessive review in the second course and squander already precious time. Thus, it seems that the 4x4 block is ill suited to foreign language education.

On a similar note, music performance courses and band are also endangered by a 4x4 block schedule. Performance in a vocal or instrumental group requires yearlong attendance of formal classes, placing 25% of one's Carnegie units in non-academic classes. This will preclude students interested in music and band from taking any other electives, if they intend to pursue music every year. Thus, a 4x4 schedule cannot easily accommodate a music program.

The most important factor is the student body. The 4x4 schedule allows students to broaden the scope of their classwork by allowing extra electives, to increase potential AP credit by taking more AP preparatory classes, and to gain more cooperative work/study experience. The 4x4 schedule can facilitate these opportunities, but it cannot ready students for them. While more motivated students tend to thrive in such an environment, preliminary studies suggest that dropout rates among less motivated students rise slightly under a 4x4 block

schedule. In addition, students who are drawn to music may feel pressed into choosing between music and the rest of academia. Finally, those students with limited attention spans may have trouble handling 90-minute periods, regardless of the innovation that teachers may bring to extended classes.

Recommendations to Teachers

The best advice that a teacher can receive when looking into the possibilities offered by a 4x4 block schedule is that each problem requires an appropriate solution. The 4x4 block format has some outstanding qualities to recommend it, but is also possessed of certain problems intrinsic to its design. Hopefully, an alert educator who is in tune with the student body and the current state of local education can help inform his or her supervisors regarding any alternative schedules considered. A brief summation will help clarify the major criteria to consider in adopting the 4x4 block schedule format.

The 4x4 schedule does not ameliorate problems of understaffing or of unbalanced teacher to student ratios and it should not be pursued with such a goal in mind. It can, however, reduce teacher fatigue associated with keeping track of a large number of students and grades.

It can be concluded that moving to a 4x4 schedule can noticeably decrease classroom disciplinary referrals. The extended length of class periods may yet be shown, however, to have a detrimental effect on referrals from class.

While preliminary evidence suggests that standardized test scores do not suffer in a 4x4-block schedule format, it allows for coverage of less content than traditional schedules. Thus, it may be concluded that the 4x4 block should not be

implemented in a situation where test scores and strict adherence to state curriculum guides are considered sacred, as its guiding philosophy is driven by different goals than such school organizations.

Certain classes require special consideration when contemplating implementation of the 4x4 format. Sequential classes such as foreign languages, and certain electives such as music performance and band are poorly suited to the schedule.

Finally, it can be concluded that student motivation plays a large part in the success or failure of the 4x4 block schedule. Motivated students excel in such an environment, while poorly motivated students sometimes fall further behind than in traditional schedule environments. Thus, it can be concluded that while a school with a highly motivated student body (such as a magnet school) would thrive on a 4x4 block schedule, a school which suffers from low student morale might find a better alternative than the 4x4 block.

If the implementation of the 4x4 block schedule format is pursued in a logical manner, its advantages can be harnessed in the situations which suit it. Conversely, hasty adoption may lead to very high profile failures. These might reflect on the format, when, in reality, they represent a failure of educators to choose a schedule appropriate to their needs. Such unfavorable press would malign an undeserving program, and might kill the 4x4 format before it reaches its potential. Hopefully, good judgement will prevail and the 4x4 block schedule will be reserved for those situations for which it is most suitable.

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